

DNA: A Powerful Tool for a One-Name Study

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DNA testing for genealogy became available to consumers in 2000, and every day attracts more participants.

DNA Tests for Genealogists

There are three types of DNA tests which are useful to genealogists.

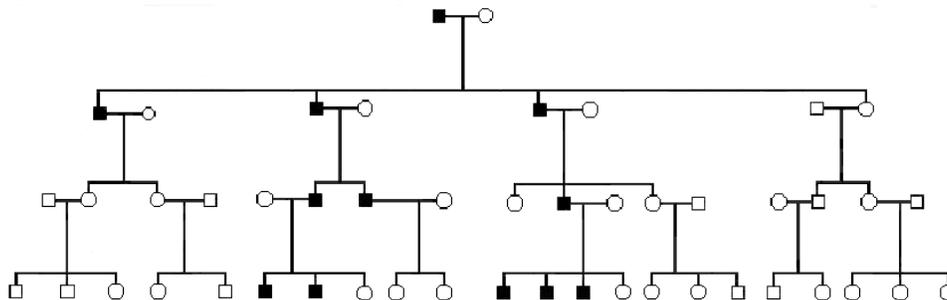
- Y-DNA
- mtDNA
- Autosomal

A Y-DNA test provides information on the direct male line, and a mtDNA test provides information on the direct female line, and an autosomal test looks across all branches of your family tree, about 5 generations back, sometimes more. This article covers Y-DNA.

Y-DNA

The primary test for a one-name study is Y-DNA, which follows the direct male line, which is a male, his father, his father's father and back in time. You must be male or find a male to take this test. This DNA test looks at locations on the Y chromosome, called markers. The Y chromosome is passed from father to son, typically unchanged. In most cultures, the surname follows the Y chromosome, making this test very valuable for genealogy research. Males inherit a Y chromosome from their fathers, and an X chromosome from their mothers. Females inherit an X chromosome from both their father and mother. These chromosomes are known as the sex chromosomes, since an XY combination is a male, and the XX combination is a female.

The chart below shows the Y chromosome being passed from father to son. If all the males shown by black squares are tested, they would be expected to have an exact or close match. Since this section of the Y chromosome is passed from father to son, typically unchanged, a son will match his father, and match his grandfather, and back in time. Occasionally a small change occurs, where a marker will increase or decrease, usually by one.



Y DNA results are a string of numbers, and the length of the string is determined by the number of markers tested. The numbers represent a count of short repeats of DNA at a location. The tests available range from 12 markers to 111 markers. When deciding how many markers to test, more markers result in more information. 37 markers are required for a genealogical time frame. In most cases 37 markers are sufficient. If the situation calls for more markers, the test can easily be upgraded later.

Below is an example 37 marker result.

12 22 15 10 13 15 11 14 11 12 11 28 15 8 9 8 11 24 16 20 29 12 14 15 15 10 10 20 21 14 14 16 19 34 35 12 10

Two men who are related would be an exact or a close match. Since men who are related will be an exact or close match, the test result contains no personal information.

The result shown above would represent the direct male line of the man tested. This would be himself, his father, his father's father, and back in time. The same result would be expected for other males in this direct male line, such as his brother.

There are cases where the link between the Y chromosome and surname are broken. These include name change, adoption, infidelity, and an illegitimate birth, where the male child takes the mother's surname. If you have two brothers, and one is adopted and one is a biological son, you would expect two different Y DNA test results.

Benefits of Y-DNA Testing

DNA testing provides information not available in the paper records, which is extremely valuable information. From a genealogical perspective, perhaps you are trying to sort out two families in the same area, to determine which of the two Williams belong to each tree. DNA testing can provide the answer. Or perhaps you have reached a brick wall, because you can't find the prior location for an ancestor. DNA testing may provide clues or provide matches to investigate. Or perhaps you are trying to make the connection to the ancestral country. DNA testing may provide clues or provide matches to investigate.

There are both short term and long term benefits of using DNA testing. The benefits of DNA testing for genealogy research are varied, and range from validating the research, to uncovering the origin of the surname.

Below are the typical benefits of DNA testing for genealogists:

- Discover information to help with family history research
- Discover information which may solve research problems, and/or resolve brick walls
- Sort out multiple families found in the same location
- Confirm or get clues regarding migrations
- Confirm suspected events, such as illegitimacy and adoption
- Find any mistaken connections in family trees
- Validate family history research
- Bridge gaps in the paper records
- Discover information about your distant origins

Y-DNA for One-Name Studies

DNA data is another source of information about a surname, and provides information not available in the paper records. The information can be invaluable in solving genealogical questions, and will tell you which family trees are related. Combining the information about which family trees are related, with surname distribution maps and early records, will tell you more about the origin of the surname than just the paper records alone.

For those that have been conducting their one-name studies for decades, and have exhausted documentary sources, DNA testing will provide additional information, as well as an opportunity to validate the family trees constructed, and to discover which trees are related.

From the perspective of a one-name study, DNA testing provides the opportunity to:

- Discover which family trees are related
- Find clues to help with research
- Confirm migrations
- Confirm surname variants or find previously unknown variants
- Discover information to define the major branches of the tree going back to the origin of the surname
- Discover information about the evolution of the surname
- Discover clues regarding the origin of the surname
- Combine results with research in early records to determine the number of points of origin for the surname
- Preserve DNA results for future research, to protect against any male line becoming extinct

DNA testing is a very valuable tool for a one-name study. DNA testing is just one component of family history research, though an important component because it provides information not available from the paper records, and can provide information about the origin and evolution of the surname.

Often, when dealing with a rare surname, it is assumed that all the persons are related. DNA testing will provide the answer, which quite often will be a surprise.

DNA testing will enable those with a one-name study to confirm surname variants or find previously unknown variants. For example, in the Meates DNA Project, DNA testing has confirmed that Meates is a variant of Myatt. The form Meates arose in Ireland from Mayott. The form Mayott, which originated in Staffordshire, evolved to Myatt in various locations in England.

Although very rare, the surname Meates also arose in two other locations, Wales and Worcestershire, from different prior root surnames. **It would not be possible to make this discovery without DNA testing.**

When DNA testing shows that trees aren't related, further investigation may uncover surname evolution not previously known where a surname evolved from a previously unknown root. Further testing and research can uncover the prior root surname.

Y DNA test results are the count of short repeats of DNA at locations called markers. On occasion, a mutation may occur. Scientists estimated that mutations occur about every 500 generations **per marker**. When comparing results from different family trees that are related, often a mutation will be identified that occurred in the distant past, between the adoption of surnames and the start of consistent written records. These mutations will identify major branches of the genetic tree for the surname.

For example, in the Meates DNA Project, all the family trees which go back to Ireland share one mutation. This mutation is assumed to have occurred before 1650 when evidence has been found of a Mayott migrating to Ireland. The mutation tells us that all these trees share a common ancestor who lived **after** the progenitor of the surname.

For those that have a surname where they can't find a connection to an origin, DNA testing is invaluable. Often, upon migration, a new form of a surname arose, and there are no clues as to the prior form or prior location.

For example, the Meatte surname (pronounced Mitt) is only found in the USA. The surname appeared in Missouri in the early 1800s, often recorded as Myette, and quickly stabilized to Meatte. DNA testing has revealed a rare result, and the distant origin is most likely Roman. No DNA matches have yet been found, so they are not related to any of the 325 people tested so far in the project. To find a connection to the ancestral country, the focus is on France, and testing of Miot trees which reside today in the proximity of old Roman forts. Miot is a surname with multiple origins.

After all trees for a surname and variants are tested, it is time to combine these results with research in early records and surname distribution maps. At this point, the one-namer has more information than previously available - DNA results. The combination of these 3 sources of information will enable you to draw conclusions about the origin of the surname. These conclusions can then be validated with an advanced DNA testing application, by testing other surnames found in early records in the same location.

Recruiting

The key to a successful DNA Project is recruiting participants. Since I already had family trees constructed when I started my DNA Project, I was able to take a systematic approach and go tree by tree, to test 2 or more participants for each tree. Two participants enable you to verify the research for those two branches, and to eliminate any mutations from consideration that occurred since the progenitor of the family tree. You then have the result for the progenitor of the family tree, and can compare this ancestral result to the results for other progenitors of other trees. On occasion, it does take testing more than 2 participants in a family tree, to resolve the source of a mutation.

For countries where I hadn't constructed family trees, such as for the Mates surname in Romania, I used postal mailings to those with the surname, and accepted their contributed family trees, and then proceeded to test two males.

Recruiting is an ongoing process, and consists of a variety of activities. These include: postings to relevant mailing lists and forums, building an email list of those with the surname, both from prior contacts as well as email

addresses found on postings, direct mail to households with the surname, posting of flyers at archives, having a DNA website, creating a Guild Profile, and using social media. Linking the Guild Profile to the DNA Project website and vice versa is important.

My recruiting efforts were very structured, such as every Friday I send form emails to one of my mailing lists, and the first month of each quarter, I would direct mail up to 100 envelopes, to a selected country and surname.

Initially, my participants were the result of contacts I already had developed over the prior years. Occasionally, I didn't have a contact for a family tree. In this case, I had to go hunting for a descendent. This was sometimes difficult, especially when the tree had multiple migrations. For example, I found the last surviving male of a Meats tree in the Republic of South Africa. For one Mates tree who left Ireland, the man was found at the US Embassy in Romania.

After my contacts were exhausted, my most successful recruiting technique has been direct mail. It doesn't take a lot of time or money to Xerox, fold, stuff, and address 100 envelopes. I get the names and addresses from online phonebooks or electoral rolls and build a chart where I keep track of responses. Often a response can identify other households on my chart that belong to his family tree.

Direct mail can also lead to unintended consequences. For example, when I mailed France, my Inbox started receiving emails in French!!! The next problem to solve was that none of the participants could read the directions to do the DNA test kit, since they didn't read English. Luckily, I found a Meats volunteer to drive to the various houses, and read the directions to the participants.

Another surprising factor of direct mail is that people hang onto the letter, even when they don't answer for years. The longest time so far from mailing to a response is 5 years - and they dragged the letter with them as they moved between various European countries. I've also had responses from next of kin, after the person to whom the letter is addressed is deceased, and they find the letter in the person's possessions.

Raising donations in migration destination countries to pay for test kits in ancestral countries is another key element of successful recruiting. Persons in migration destination countries want to find the link to the ancestral country, and many gladly contribute to pay for test kits in the ancestral country. In my project, donations have ranged from small sums, to a monthly commitment.

Recruiting is an ongoing process to have a successful DNA Project.

Conclusion

We are only at the beginning of the discoveries that will come from the scientists regarding DNA testing, and preserving samples, especially for male lines bordering on extinction, is very important.

DNA testing is a powerful and invaluable tool for a one-name study. So many of my discoveries wouldn't have been possible without DNA.